



Chevron/AC Transit H2 Station

Prepared for

Workshop on Facilitating Permitting of Hydrogen Fueling Stations California Air Resources Board (CARB) February 1, 2007

By

Mike Mackey, PE

General Physics Corporation

2430 Vineyard Ave., Suite 103

Escondido, CA 92029-1226

Ph: 858 .259.5081

Fax: 760.233.9881



Leading the World to Better Performance

www.gpworldwide.com

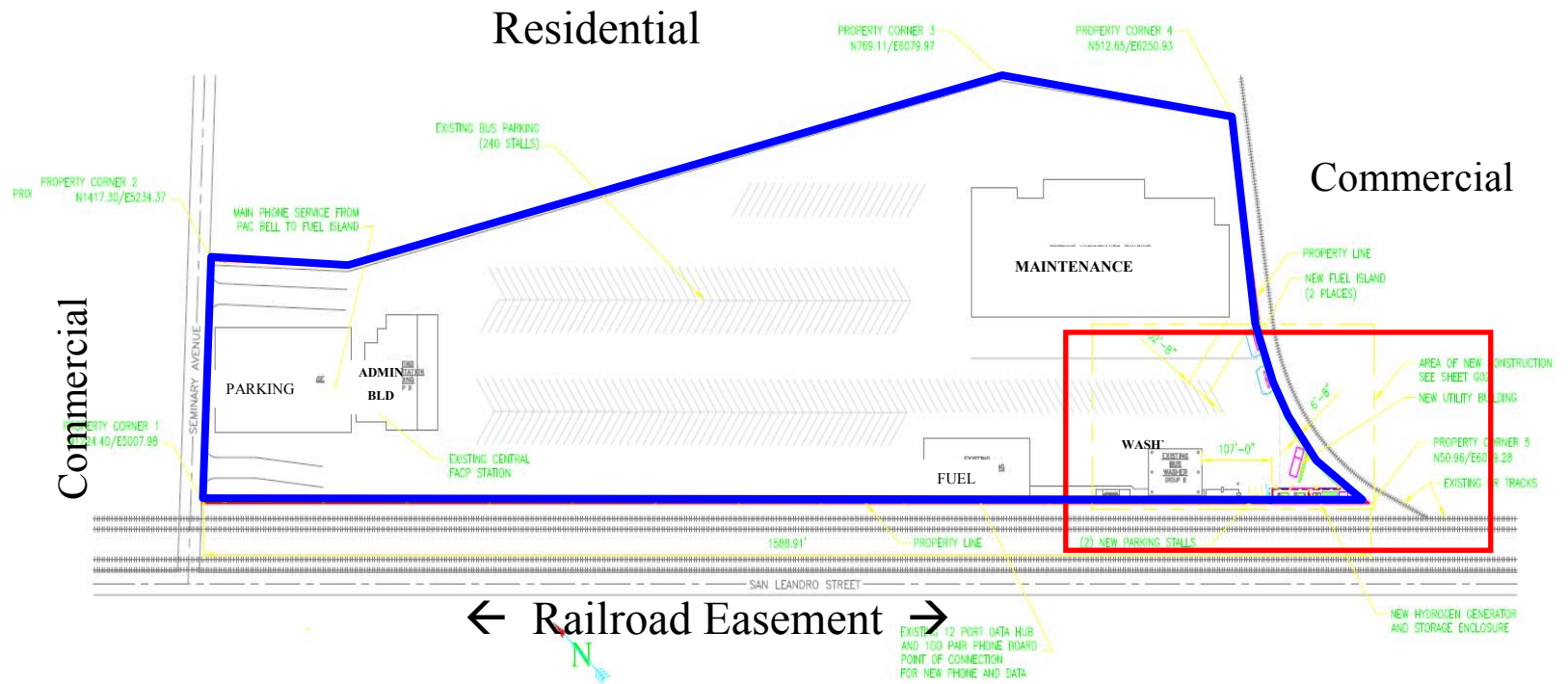


Chevron – AC Transit Project

Who is GP?

- **1300 employees, NYSE symbol: GPX**
- **Designed over 50 LNG/LCNG alternative fuel stations in US over the last 7 years**
- **Built some of the largest LNG/LCNG fuel stations with storage capacity in excess of 60,000 gallons**
- **Built Chevron's 1st 4 hydrogen refueling stations**
- **Design/Built AC Transit and Selfridge ANGB hydrogen Fuel stations**
- **Voting member of NFPA 52**

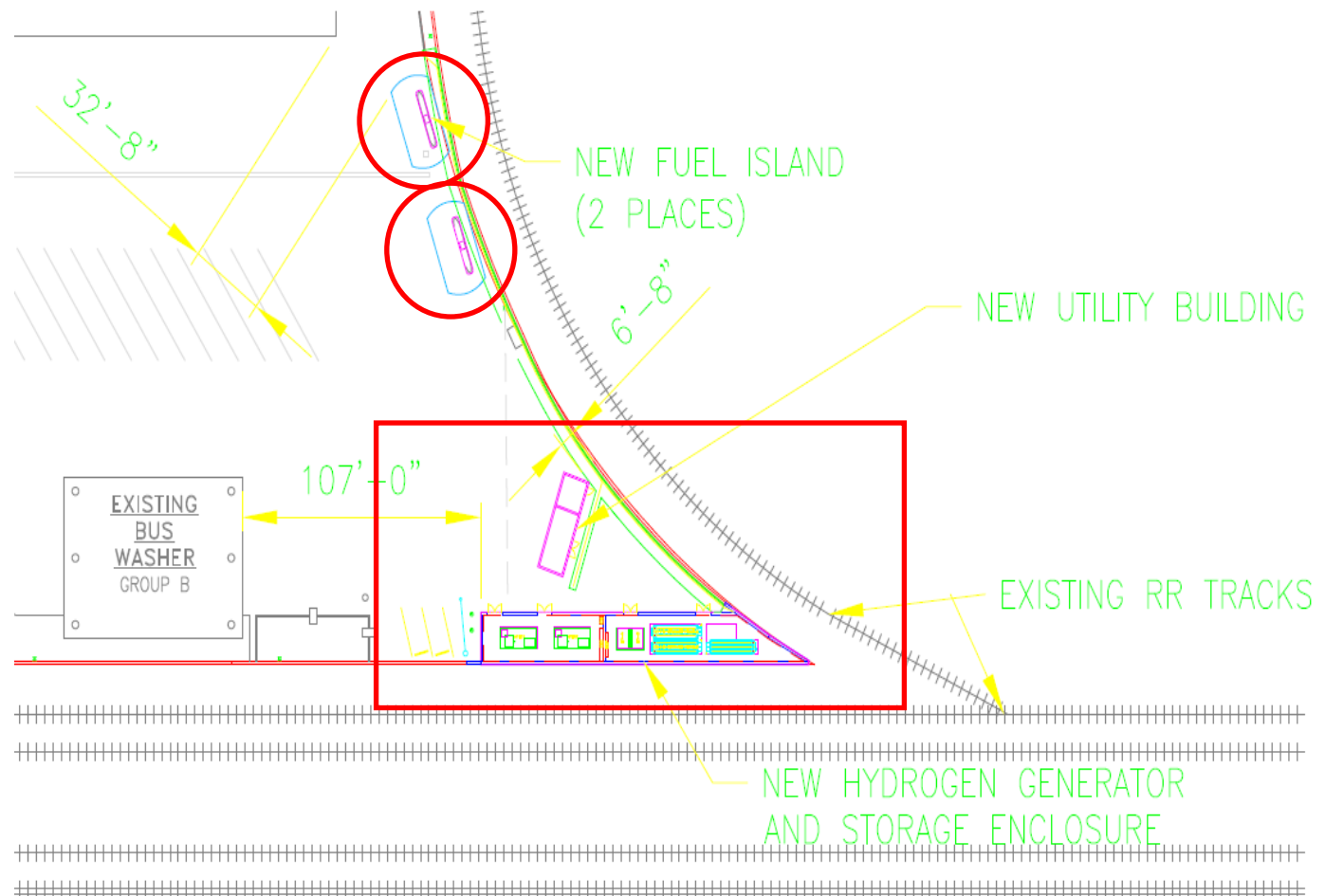
Chevron – AC Transit Project



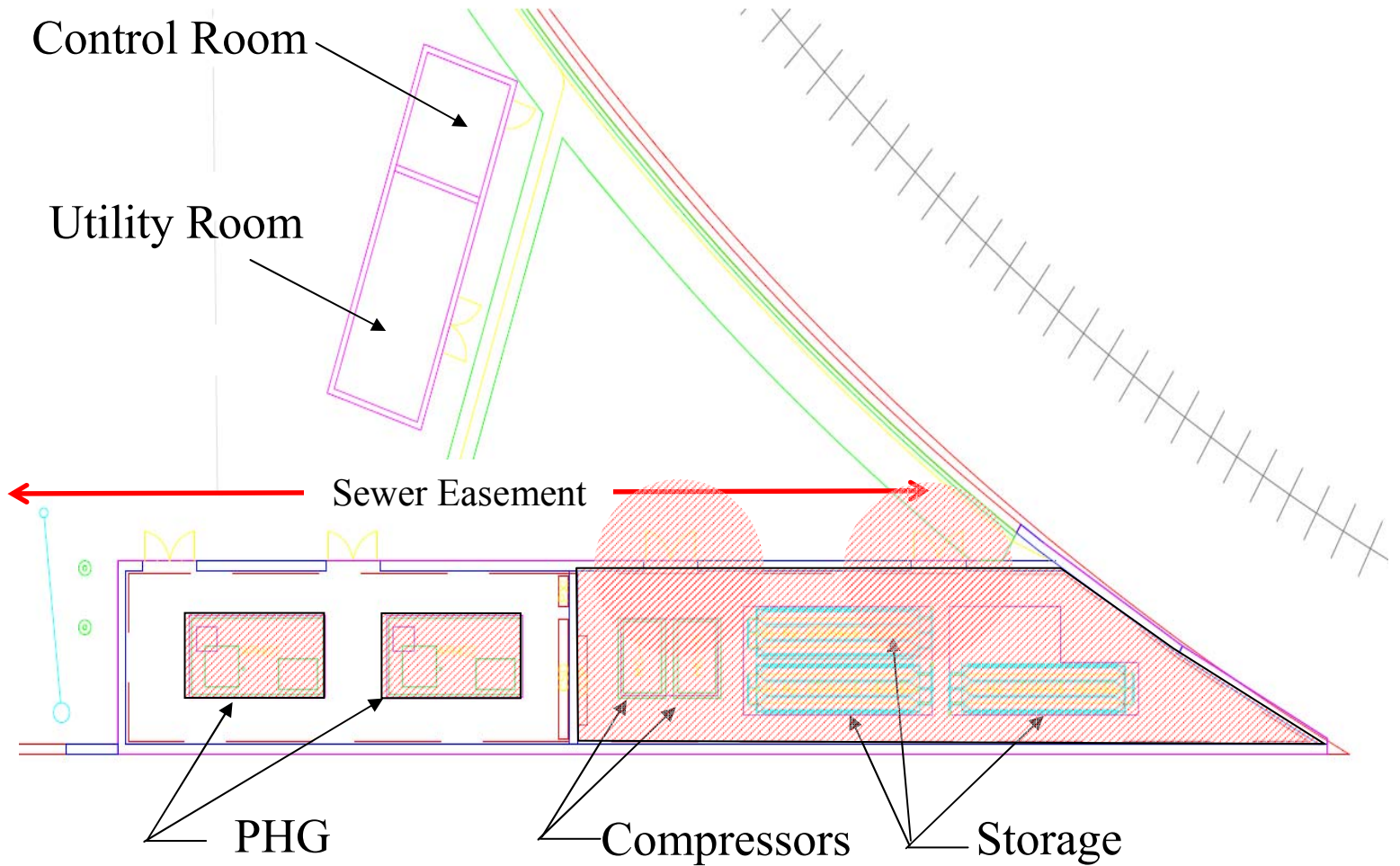
Commercial



Chevron – AC Transit Project



Chevron – AC Transit Project



Chevron – AC Transit Project





APPLICABLE CODES:

2001 California Building Code*

2001 California Mechanical Code*

2001 California Plumbing Code*

2001 California Fire Code*

2002 National Electrical Code (NFPA 70)

2002 National Fire Alarm Code (NFPA 72)

1999 Gaseous Hydrogen Vehicle Fuel System Code
(NFPA 50a)

2001 ADA Standards For Accessible Design**

*As Amended And Adopted By The City Of Oakland

** CBC Does Not Exempt Hazardous Areas From ADA Requirements





Permitting

Stakeholder Analysis and Engagement

- **AC Transit's Richmond experience provided reference point for Oakland officials**
 - 50/50 chance of helping
 - This was not helpful for the Rosemead project w/ the nearby Chino hydrogen station
- **AC Transit's outreach was key**
 - Meet with Mayors office and planning officials and held open house for city officials
- **Meet with fire department early**
 - Discussed codes that could be used as guidance
 - Discussed overall scope of project



Permitting

Detailed Engineering / Permitting

- **Site Analysis / Permit Check List**
 - Review of City of Oakland ordinances and code amendments
 - Code review of preliminary site layout

CUP

- Provided preliminary plan and elevation drawings for conditional use permitting early

Detailed Engineering

- Civil / Mechanical / Structural / Electrical / Signage
- Expect to have to resubmit drawings for plan review



Lessons Learned – AC Transit

- **Right team mix to meet with each stakeholder**
 - AC Transit meetings w/ Mayor's office and Planning Department
 - Chevron/GP meetings with Fire Department
 - GP meetings with building officials
- **UBC / CBC Occupancy Barriers**
 - Occupancy Groups H-2, S-2, and S-3
 - Construction Types V-1 and V-N
- **Local Amendments to National Codes**



Lessons Learned – Other Alternative Fuel Stations

Planning Commissions

- Start early – could take 6 months or longer

Fire Alarm Code

- Tie-into central FACP
- Sprinkler / non-sprinkler decision early in design

Waste Water Discharge Permits

- Who has authority to issue permits

Natural Gas Service

- Emphasize elevated service needs to utility early
- Emphasize City Inspector to “release for elevated service”

Power

- Allow 3 month for utility planning



Lessons Learned – Other Alternative Fuel Stations

Be Aware of Local Amendments to Codes

- Local codes may limit or prohibit above ground flammable storage
- Special requirements for underground utilities
- CA: Permit to Operate for Air Receivers w. CA Pressure Vessel Unit
- ASME B&PV Requirements vary by state (DOT not allowed)

ASME B31.3 Process Piping Code

- Do not rely on building inspectors to verify compliance

Two Most Difficult and Frustrating Permits to Obtain

- Sign Permits
- Landscape Permits





Recommendations

Permitting Officials

- Help the “out of town experts” with the local codes and permitting process

Organizations Planning to Implement Project

- Early discussions with Planning Commissions and Planning Boards
- Allow 3 months in schedule for permitting – everyone is understaffed
- Follow standard protocol for dealing with building department

DOE / NHA Organizations

- Provide 3rd party consultant for local building officials to call regarding questions on hydrogen safety and hydrogen design standards.

Safe Hydrogen Fuel Station are Critical for the Industry

Questions?

Contact Information

Mike Mackey, PE
Director, Alternative Fuels
General Physics Corporation
2430 Vineyard Ave., Suite 103
Escondido, CA 92029-1226

Ph: 858.259.5081

Fax: 760.233.9881



Leading the World to Better Performance

